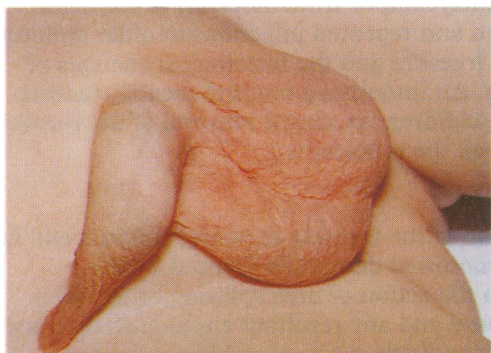


PROBLEMS WITH THE PENIS AND PREPUCE

Mark Davenport

Natural history of the foreskin



Non-retractile foreskin of infant boy (normal for age).

Natural course of foreskin separation

	<i>Presence of retractile foreskin</i>
Newborn infants	4%
1 Year old boys	50%
4 Year old boys	90%

The foreskin envelops the glans from the fifth month of gestation. It begins dorsally and ends by fusing ventrally to cover the newly formed urethra. Actual fusion between the two epithelial layers of glans and foreskin is apparent at birth and has been termed physiological phimosis. This non-retractility remains in most boys for at least the first two years of life until natural separation ensues.

Two conditions that are related to the process of preputial separation may give cause for concern. Firstly, the process may be uneven, with adhesions between glans and prepuce persisting even up to adolescence. Secondly, the desquamation of epithelial cells between the glans and non-retractile foreskin leads to accumulation of "pearls" of a white smegma-like substance. Both conditions are usually without actual symptoms and, as they are usually harmless, should not precipitate undue intervention.

History of circumcision

"And God said unto Abraham, Thou shalt keep my covenant therefore, thou and thy seed after thee in their generations.

This is my covenant, which ye shall keep, between me and you and thy seed after thee; Every man child among you shall be circumcised.

And ye shall circumcise the flesh of your foreskin; and it shall be a token of the covenant betwixt me and you."

Holy Bible. Genesis xvii, 9-11

Circumcision is one of the earliest operations, being recorded by the ancient Egyptians and other peoples of the Near East. Neonatal circumcision on the eighth day of life is a tenet of the Jewish faith and is performed by a mohel, often a vocation which is passed from father to son. In order to emulate the prophet Mohammed, Muslims also perform circumcision, and, though the timing is less strict, it is usually done well before puberty.

The fashion of routine neonatal circumcision, other than for overtly religious reasons, has varied over the years. After the second world war almost 95% of male infants born in the United States were circumcised (usually by obstetricians) for reasons of "hygiene." This practice has declined, and in 1971 the American Academy of Paediatrics stated: "There are no valid medical indications for routine circumcision in the neonatal period." Yet even today, there is still debate in the medical literature on the possible benefits of routine circumcision—though this is perhaps carried out with rather more heat than light. The arguments for the routine use of any operation, however simple, have to be outstandingly convincing as any surgical procedure has its attendant risks and complications. Certainly, circumcision has a long list of possible complications, the commonest being infection and bleeding.

Circumcision for religious reasons is not funded by the NHS. This can sometimes be a problem in areas with a high proportion of Muslims in the community

It has been stated that circumcision is still performed too often in Britain, where routine circumcision has never been prevalent. For instance, of a group of 420 boys referred to a paediatric surgical unit in Liverpool with a diagnosis of phimosis requiring circumcision, over half had a non-retractile foreskin appropriate to their age and required only reassurance.

Phimosis and paraphimosis

Phimosis

- Primary—rare
- Secondary—recurrent infection and scarring
- Overdiagnosed in boys aged under 2 years

Phimosis

(Greek, *phimōsis*—muzzling or closure)
Inability to retract foreskin due to narrow preputial ring

Paraphimosis

Inability to pull forward the retracted foreskin

Balanitis

(Greek, *balanos*—acorn)
Inflammation of the glans

Posthitis

(Greek, *posthē*—foreskin)
Inflammation of the foreskin



Balanitis xerotica obliterans.

Louis XVI of France is said to have had such a severe phimosis that erections were extremely painful. He was so afflicted with this that he was unable to consummate his marriage to Marie Antoinette for at least four years. Much to their relief, a circumcision later cured him completely

Alternatives to circumcision

- Preputial stretching
- Preputioplasty

Phimosis

True phimosis (that is, not just non-retractility) may rarely be a primary and congenital anomaly but is much more commonly secondary to repeated attacks of infection that cause scarring and narrowing of the preputial ring.

Difficulty with voiding and ballooning of the prepuce are the commonest reasons for referrals, though recurrent bacterial infections (balano-posthitis) may also occur. Overt infection should be treated with antibiotics (such as amoxycillin or trimethoprim) in the acute stage. Chronic inflammation and repeated infections in older children may lead to a rigid, fibrous foreskin and the histological changes of balanitis xerotica obliterans. An underlying urethral meatal stenosis must be looked for in these children, as simple removal of the foreskin may not completely relieve all the symptoms.

Redness and inflammation of the foreskin in young children still in nappies may be part of ammoniacal dermatitis (caused by the liberation of ammonia from the action of urea splitting organisms). Clearly, if this is misdiagnosed and any resultant circumcision removes the protective foreskin, the condition is considerably aggravated.

Paraphimosis

This occurs when a foreskin has a somewhat narrow preputial ring that may be retracted behind the glans but cannot be easily pulled forward. This condition is acutely painful, and medical attention is often hurriedly sought. Manual reduction after some form of anaesthesia literally reduces the problem. If it is recurrent then a circumcision is advised.

Urinary tract infection

There is certainly a relation between susceptibility to urinary tract infections and an intact foreskin in boys, with the preputial sac presumably acting as a reservoir for organisms. Although investigations such as ultrasonography, voiding cystography, and possibly an intravenous urogram should be performed after even a single proved urinary tract infection in a boy, consideration should also be given to circumcision as a prophylactic measure, especially if organisms such as *Proteus* spp have been cultured.

Treatment

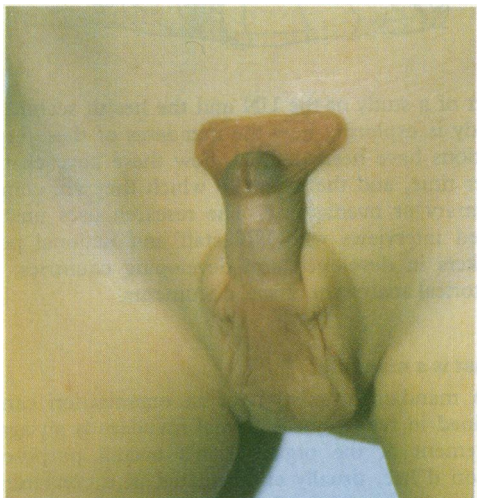
Circumcision—This is typically performed as day case surgery with the patient under general anaesthesia. The wound should be repaired with fine, absorbable sutures and preferably left without any superfluous dressings.

Surgical alternatives—There are several alternatives to a formal circumcision that may be useful in some cases. For some pliant unscarred foreskins, a preputial stretch may be used. This can even be done under local anaesthesia with, for example, Emla cream. Some surgeons may perform a preputioplasty, with the aim of increasing the diameter of the preputial ring but without excising the prepuce. The Plastibell (Holister) has been used to circumcise infants in the community setting. This has closely fitting inner and outer domes that sandwich the mobilised foreskin. Pressure necrosis at the rim over the next few days then causes the device to come away with the foreskin, leaving a circumcised appearance. Currently, it is used by only a few general practitioners in Britain.

Hypospadias and epispadias



Mid-shaft hypospadias.



Coronal hypospadias and a dorsal hooded foreskin.

Hypospadias

The male phallus increases in length during the first trimester, and parallel ventral urethral folds arise alongside a median urethral plate. Urethral tubularisation then occurs in a proximal to distal direction under the influence of fetal testosterone. Failure to complete this tubularisation process leaves the urethral opening at some point short of the glans and is termed hypospadias. This is a relatively common anomaly, occurring in perhaps one in every 300 boys. Over the past few decades there has been an increasing prevalence of hypospadias in newborn infants, which has been speculatively linked to exposure of male fetuses to increased amounts of environmental oestrogens.

Hypospadias is usually associated with an unfused or hooded dorsal foreskin and an element of tethering and bending of the distal penis and glans known as chordee. The severity of hypospadias can be assessed and named from the position of the urethral opening and ranges from perineal to glanular hypospadias.

Although such penile anomalies should be diagnosed at the first postnatal examination, minor degrees of glanular hypospadias may not present until much later. The more severe degree of proximal hypospadias should warn of the existence of other genitourinary anomalies, and, at the very least, an ultrasound examination of the kidneys and bladder should be requested. Rarer cases where the hypospadias forms but one component of ambiguous genitalia must be recognised and referred early to specialised centres.

Surgical reconstruction is usually delayed until about the second or even third year of life; it is important to exclude at an earlier stage any element of meatal stenosis. A fine stream and obvious difficulties in voiding are suspicious. Clearly, after a diagnosis of hypospadias, it is also important to advise against any form of circumcision as the foreskin may well be required for later reconstruction.

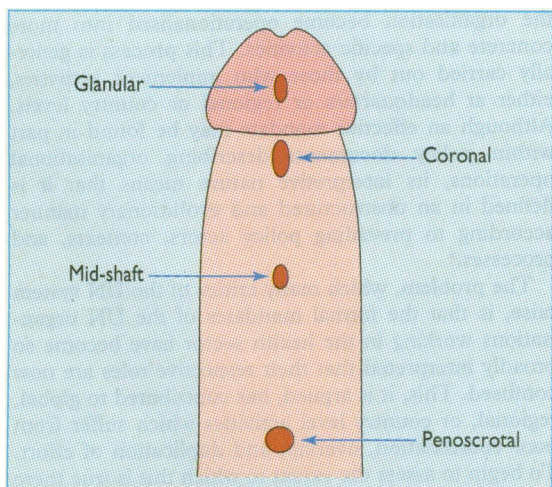
Surgery—Most paediatric surgeons would now aim to correct hypospadias in one stage. Although over 150 different operations have been described, most surgeons use a combination of two or three well rehearsed procedures. These demanding operations have an incidence of complications (typically urethral stenosis or fistulae), but the long term result is usually good.

Epispadias

The much rarer anomaly of the urethral meatus opening on the dorsal aspect of the penile shaft is termed epispadias. Most forms of this anomaly are associated with ectopia vesicae (the bladder being opened out as a disc on the anterior abdominal wall), bladder neck defects, and a splayed pelvis, but it can occur as an isolated anomaly.

Some of the clinical illustrations were supplied by Professor Lewis Spitz, Institute of Child Health, London.

The ABC of General Surgery in Children is edited by Mark Davenport, consultant paediatric surgeon, department of paediatric surgery, King's College Hospital, London.



Range of possible urethral openings in hypospadias.